

56. *Segmentina armigera* Say, rather scarce, but found living, under dead leaves, even after prolonged drought.

57. *Physa gyrina* Say, rather scarce, a small form, under the same conditions as 56 and 60; a larger form is common in a drainage ditch, outside, which is usually dry in summer except after heavy rains.

58. *Aplexa hypnorum* Linné, with 61, scarce, small; one specimen was found with 53.

59. *Amnicola cincinnatiensis* Lea, one dead shell was found in a small ditch (with 52 a), far away from a creek.

60. *Sphærium occidentale amphibium* St., common at lower places in the woods; even after the ground has been dry for weeks, these mussels are found living, at all stages of growth; not found with 61!

61. *Musculium truncatum* Linsley, frequent in pools where water lasts longer, but which are usually dry during summer.

62. * *Pisidium abditum* Haldeman, not rare in the ditch mentioned under 57.

It appears to be worth noting that some species have not been found, which should be expected at such a place rather than many of those listed, e. g. *Zonitoides nitidus*, *Enconulus fulvus*, *Polygyra multilineata*, *Bifidaria tappaniana*.

NOTES ON MOLLUSCA OF CENTRAL MONTANA.

BY S. STILLMAN BERRY,

Redlands, California.

Some two years ago I published in the NAUTILUS (vol. 26, pp. 130-131) a short list of mollusks taken at Winnecook, Meagher County, Montana. Having had occasion to visit the same locality, and hence the opportunity to make further collections, every summer since, it now seems worth while not only to record the additional species which have been found, but to revise the first list in its entirety. A fairly good idea

may be gained of the way the various species run by the numbers of specimens taken, recorded in parentheses after each species. In 1914 I kept a fairly accurate census of the living specimens collected (first number in parenthesis), and in 1915 did the same for the drift specimens, and these figures indicate fairly well the relative abundance of the different forms. All this drift material (listed in the second number in parenthesis) was taken from three quarts, gross measure, or one and a half pounds of fine flotsam, scooped up from one little pocket on the bank of the Musselshell River.

Mollusca of Winnecook, Montana.

- Vallonia costata montana Sterki (88 ; 390).
 Pyramidula cronkhitei (Newc.) (68 ; 98).
 Vitrea hammonis (Ström.) (5 ; 22).
 Zonitoides arborea (Say) (70 ; 15).
 Zonitoides minuscula (Binn.) (0 ; 41).
 Euconulus fulvus (Müll.) (12 ; 4).
 Agriolimax campestris (Binn.) (7 ; 0).
 Pupilla blandi (Morse) (0 ; 4).
 Vertigo binneyana Sterki (7 ; 81).
 Vertigo ovata (Say) (0 ; 1).
 Cochlicopa lubrica (Müll.) (8 ; 14).
 Succinea avara Say (1 ; 9).
 Succinea oregonensis Lea (1 ; 0).
 Succinea retusa Lea (21 ; 0).
 Lymnaea caperata Say (unrecorded ; 12).
 Lymnaea palustris Müll. (unrecorded ; 1).
 Lymnaea parva Lea (0 ; 19).
 Planorbis antrosus Conrad (taken in 1914).
 Planorbis parvus Say (0 ; 11).
 Planorbis umbilicatellus Ckll. (0 ; 10).
 Physa gyrina Say (taken 1914).
 Aplexa hypnorum (Linn.) (taken 1914).

The list brings out a somewhat curious mingling of eastern and western forms at a point which is well to the eastward of the Continental Divide. The intimate association of apparently

typical *Succinea oregonensis* (a characteristic western species) with equally representative *S. avara* in the self-same *swale* is very interesting.

The *Euconulus* are *E. fulvus* all right, but a few of the specimens furnish at least an approach to the *alaskensis* of Pilsbry.

Vallonia costata montana has been by all odds the most abundant species taken. Mr. Vanatta kindly compared some of the Winnecook shells with Sterki's types of this form in the collection of the Philadelphia Academy, so that the identification seems a comfortably certain one. He writes that "the smallest-sized *Vallonia* are just about the size of the types," so that it would appear that Sterki's specimens were not characteristic in size or represented a somewhat smaller race.

The single *Planorbis*, previously reported with considerable doubt as *P. callioglyptus* Vanatta, was also sent to Mr. Vanatta. He was unable to confirm the identification, so that the species is here rejected from the list. The specimen is probably too young for safe determination.

Despite diligent search I have as yet discovered not a single mussel shell in the Musselshell River. I one day picked up a single worn and minute fragment on the shore, and that is all.

Mollusca of Oxford, Montana:

In a small stream called Elk Creek at a point about one mile south of Oxford Station, Meagher County, the following species were taken in the month of June, 1914 and 1915.

Pisidium compressum Prime.

Pisidium compressum laevigatum Sterki.

Planorbis parvus Say.

Physa gyrina Say (very large).

Lymnaea caperata Say.

Lymnaea obrussa Say.

Lymnaea palustris Müller.

Lymnaea parva Lea.

Vallonia costata montana Sterki (dead).

Swimming Woman Creek Canyon.

On July 4, 1914, a very brief visit to Swimming Woman Creek Canyon in the Big Snowy Mountains resulted in the following collection:

	East wall	Canyon floor
<i>Vallonia costata montana</i> Sterki	30	5
<i>Thysanophora ingersolli convexior</i> Ancey (dead)	14	—
<i>Oreohelix cooperi berryi</i> Pilsbry.	55	—
<i>Pyramidula cronkhitei</i> (Newcomb)	2	2
<i>Zonitoides arborea</i> (Say) (very large)	6	1
<i>Euconulus fulvus</i> (Müller)	7	3
<i>Vitrina alaskana</i> Dall (dead)	2	2
<i>Pupilla muscorum</i> (Linn.) (dead)	1	—
<i>Vertigo modesta parietalis</i> Ancey (dead)	4	—

The *Euconulus* seem to me for the most part intermediate between typical *fulvus* and *alaskensis*. They could perhaps be classified with equal exactitude either way.

The *Oreohelices* listed are members of a very small race described in a recent number of this periodical by Pilsbry (NAUTILUS vol. 29, p. 48), but it is so much the most conspicuous snail of the region that such figures of population as those given in the above columns indicate the relative abundance of all the smaller forms in a very unsatisfactory way. I doubt very much whether *Oreohelix* actually does replace *Vallonia* as the most abundant snail, even at this altitude. Live shells of both were fairly common, and dead ones abundant all over the eastern wall of the canyon at the spot visited, occurring at or near the surface among the mass of small loose rock and shrubbery which covered the slope. The other species, where so noted, were in the same situation, while those taken on the floor of the canyon were found under sticks and small logs in rather moist situations along the creek.

The locality for both slope and floor is just within the mouth of the canyon, and is probably just south of the present county line. If so, this would bring it into Musselshell County and not Fergus, as stated in the original description of *O. c. berryi*.

I am unable to find that any previous collecting has been done either in the Big Snowies or the neighboring ranges, but Mr. Robert Wellington brought me a few specimens of a larger and more typical race of *Oreohelix cooperi* from near the head of Neil Canyon, on the same side of the range as the present locality, but some miles to the westward.

It might be added that I have taken *Planorbis antrosus*, *Physa gyrina*, and *Lymnaea caperata* in some abundance in the pools and ditches along the river bottom at Harlowton, Montana.

I am indebted to Mr. Frank C. Baker for determinations of the *Lymnaeidae* mentioned in this article : to Mr. E. G. Vanatta for various help in verifying and comparing specimens ; and likewise to Dr. H. A. Pilsbry and Mr. George H. Clapp.

REVERSED OR SINISTRAL SHELLS.

BY F. A. SAMPSON.

In NAUTILUS, vol. ix., 1895, p. 94, Prof. Wetherby told of three reversed shells which had belonged to him. A *P. thyroides* and a *P. multilineata* he had given to John G. Anthony for the Cambridge collection, and at that time he had another *thyroides* in his collection. He did not give the locality of the shells, but as he had formerly lived at Cincinnati, it is probable that the shells were from that neighborhood. He knew of a third *thyroides* collected near Cincinnati by Mr. Stannage, and of a *mitchelliana* collected by Prof. F. W. Bryant near the same place. Dr. Lewis had an *albolabris* in his collection.

In NAUTILUS, vol. x, January, 1897, p. 104, C. F. Ancey gave a list of 21 sinistral specimens of shells that were normally dextral. Only two of them were American—*Polygyra thyroides* from Connecticut, and *Campeloma decisum* from New York.

In the February number of the same volume Pilsbry reported that he had a collection of *Campeloma decisum* made by W. W. Jefferis, of Philadelphia, collected at Fort Edward on the Hudson River, New York, examined for sinistral shells, and among